SWEETWATER COVE LAKE

FISH KILL UPDATE AND BIOASSESSMENT REPORTS

May 28, 2015:

Greetings Sweetwater Cove Lake Residents,

We have been monitoring the tributary lakes daily since Tuesday, May 19th, taking several water chemistry samples and field measurements which include temperature, pH, and dissolved oxygen. We are waiting for the chemistry analysis to be completed which generally takes two weeks for the laboratories to process. Once this is reviewed, we will update you with any developments. As is, the common factor likely to have caused the fish kill was low dissolved oxygen levels. We are still investigating what factors lead to the reduced dissolved oxygen levels.

The current condition of Lower Lake is showing low dissolved oxygen (DO) levels, high water temperatures, and increased water turbidity. In addition to these conditions, a waterbody that is experiencing large algae mats and minimal flow (due to lack of rain) indicates that **a fish kill has the potential to occur**. Early morning hours are generally when a fish kill will occur since organisms (such as algae) are consuming oxygen (respiring) throughout the night. Once sunlight is available, these organisms switch from respiration to photosynthesis which is a process that oxygenates the water. Sustained low DO levels, as result of a cloudy day or nighttime hours, will cause fish to stress to the point of a kill. The most common factors for fish kills in Florida are cloudy weather, excessive algae or plant growth, and high water temperatures.

As frequently stated in our bioassessment reports, we continue to treat patches of floating algae to accelerate the breakdown and reduce negative impacts to the DO levels. Lack of rains, increased water temperatures, and decreased flow are currently creating more of an algae bloom than normal. As a reminder, contact with surface water where there is a visible algae bloom is not recommended.

Photos: Planktonic algae (in background) and blugreen algae bloom surrounding the Lyngbya along shoreline on Lower Lake

Lyngbya is a very difficult exotic algae species to manage because it has a protective cell wall (sheath) that is made up of calcium carbonate. This makes it difficult for most herbicides to penetrate the cell wall. In discussing with several Lyngbya experts over the last year, we suspect certain areas of the Lower Lake are more prone to excessive Lyngbya growth than others. Lyngbya is considered a toxic cyanobacteria and understanding why there are large growth mats occurring in these lakes, especially the Lower Lake, is why the Lyngbya study is currently being conducted.

Additionally, since we are minimally impacting the Lyngbya using the current permitted chemicals issued by the State (Florida Fish and Wildlife Conservation Commission [FWC]), we are seeking FWC's approval and guidance for chemical alternatives. Since November 2014, we have been closely working with FWC to develop an effective herbicide treatment plan targeted at the Lyngbya. This plan involves utilizing copper based herbicides. Since your lakes drain into the Wekiva River, we have to ensure that best lake management practices are being conducted

and that minimal effects will occur to this pristine environment. With FWC's guidance, we shipped samples of your Lyngbya and lake water to researchers at Clemson University in December 2014. They have a team who specializes in Lyngbya treatments and through laboratory trials; a treatment prescription was developed specifically for your Lyngbya. With the treatment prescription formulated, FWC has been conducting dye-tests as mentioned in our March 2015 update in preparation for the actual test application. Last week, Tuesday May 19th, a tenth of the Lower Lake received a test treatment plot strictly using the Clemson results. FWC sampled post herbicide treatment for copper concentrations and we are waiting for these results. Since the treatment plot and amount of algae was small, we do not find this to be a factor related to the fish kill. Herbicide treatments can cause a DO fish kill when they are improperly used/applied. Most cases occur when too much plant or algae is targeted at one time or when herbicide product is used in excess. The treatment plan was isolated and controlled which was reviewed and approved by multiple agencies and researchers thus eliminating this as a contributing factor.

There are 2 events that we are looking into: one was a rain event the night of Tuesday, May 19th and the second was 2 million gallons of treated wastewater being discharged into the creek the night of Wednesday, May 20th; prior to the fish kill. We will continue to monitor the tributaries and analyze the additional laboratory data once we receive it to try and further piece together the root cause of the fish kill.

Given the current instability of the Lower Lake, herbicide treatments will be on hold until Lower Lake stabilizes. Middle and Upper Lakes (including across Wekiva Springs Road) will continue to receive routine monthly herbicide treatments.

We know that communicating the most accurate information as possible is paramount to understanding the complexity of your waterbody. We make every effort to host educational presentations in efforts to reduce nutrients entering your waterbody (which feeds the algae), sponsor aquatic planting restoration events, and frequently email our bioassessment reports on activities being conducted. We can certainly work on getting more email addresses so that the community as a whole is better informed and your liaisons are in the process of obtaining the most accurate email list to achieve this goal.

I want to personally thank those who have assisted us in distributing our bioassessment updates!

May 21, 2015:

Greetings Residents of Sweetwater Cove Lakes,

Earlier this morning a small fish kill was reported in the **Lower Lake**. Lake Management Program conducted an inspection today taking ambient water quality measurements (such as temperature, pH and dissolved oxygen levels) throughout the entire tributary lake system documenting this event. Approximately 400 dead fish were noted, some of which were still on the bottom of Lower Lake. The parameters we collected today were all in the normal range and indicated that the cause for the kill is unknown at this time. We are collecting various water chemistry samples tomorrow and next week to further understand what the cause may have been as well as weather/rainfall and any other available data.

With today's inspection, we have seen a complete recovery from the fish kill event in the Lower Lake; fish swimming and dissolved oxygen levels at normal range. Nature's recyclers have been assisting in the clean up as many waterfowl, vultures, turtles, and alligators are consuming the fish; this is a natural process.

We are working closely with the Florida Fish and Wildlife Conservation Commission on this event as well as your community liaisons. Should you have any questions please feel free to contact me or one of your liaisons for assistance.

Lake Management Program will return on Tuesday to conduct further inspections.

OCTOBER 2014 THROUGH MARCH 2015 - LAKE BIOASSESSMENTS

Greetings Sweetwater Cove Lake Residents,

Lake Management Program (LMP) biologists surveyed the aquatic plants in Sweetwater Cove Lakes on the following dates: 10/29/14, 12/9/14, 12/16/14, 2/18/15, and 3/17/15. The next inspection date will be **April 21st, 2015**; weather permitting.

Algae Monitoring and Algae Control Devices (Lower Lake):

A great deal of algae growth (Lyngbya species) within the Lower Lake continues to be observed. Due to the lack of results from the sonic devices, this pilot project has been concluded and the units are scheduled to be removed. Thank you to the Wilkie's, Marra's, and Gwinn's for their cooperation and participation with conducting this study!

Chemical treatments will continue on a bi-weekly basis and we have been working with FWC on adding additional chemical(s) to our permit in order to combat the Lyngbya growth. A dye-test was conducted by FWC on the exiting outfall and results of this test are currently being evaluated by FWC. Lyngbya is a very difficult aquatic species to manage because it has a protective cell wall (sheath) that is made up of calcium carbonate. This makes it difficult for most herbicides to penetrate the cell wall.

Photo: Lyngbya built up around sonic device (east end of Lower Lake); photo taken March 17th, 2015.

Lyngbya Study:

We continue to seek new and effective control measures for Lyngbya and as part of this effort; we have commenced a study to determine possible nutrient sources that is contributing to the accelerated growth of this exotic algae. Environmental Research & Design, Inc. (ERD) is currently conducting a study which is funded by Seminole County. This study includes a 12 month field monitoring program to identify potential sources of nutrient loadings fueling the Lyngbya outbreaks and to provide recommendations for interception or inactivation of the phosphorus loadings before becoming available for uptake by the algae. This project will evaluate nutrient sources resulting from groundwater seepage as well as loadings from nutrient-rich sediments. Seepage meters will be installed in areas of the Lower Lake with and without excessive Lyngbya growth to determine if differences exist in seepage loading rates to evaluate whether seepage inflow could be a potential source of nutrient loadings. One of the inputs under evaluation by ERD is groundwater seepage, which consists of shallow subsurface inflow around the perimeter of the lake. Groundwater seepage has been shown to be a significant input to many

lakes in the Central Florida area. This input is evaluated using an aluminum underwater chamber which is placed on the bottom of the lake. A schematic of a typical chamber is shown below. Water which seeps into the lake from groundwater is collected in a plastic bag which is attached to the seepage meter. The bag is retrieved by a diver, and the volume of water is measured and a sample collected for lab analyses. This information is used to estimate the volume and quality of groundwater seepage entering the lake.

A total of 10 seepage stations were installed in the Lower Lake. These meters will remain in the lake until ~December, 2016. ERD personnel will collect samples from the meters on a monthly basis. The locations of the seepage meters are indicated by floats connected to the meter by a steel cable.

Please do not disturb this equipment. If you notice a meter which has been damaged, please call ERD at 407-855-9465.

Photos: Groundwater seepage sampling station. Please do not disturb.

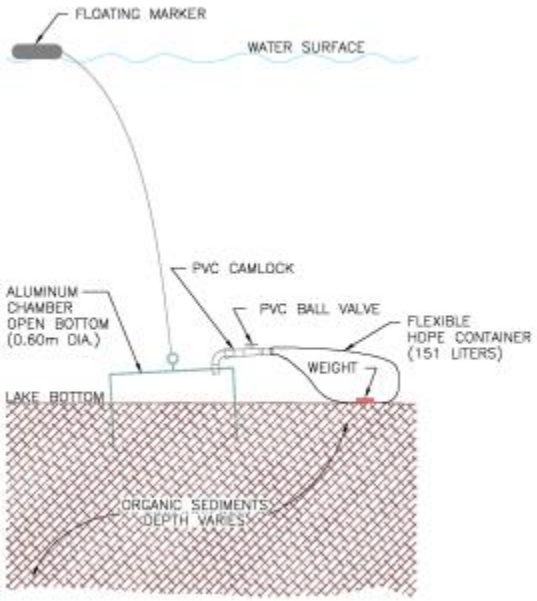

Photo: Overview of Lower Lake taken on March 17th (left) and December 9th, 2014 (right). Recent rains and herbicide treatments have reduced the algae biomass.

Middle and Upper Lakes:

The remaining lakes (middle and upper) are routinely receiving algae treatments along the margin of the lakes in conjunction with the emergent plant control treatments. The lilies present on the south side of Wekiva Springs Road are being monitored for when next treatment will occur. The lilies in the Upper Lake will be targeted for treatment upon next service date.

Photo: Middle Lake overview.

Restoration Event:

The fourth Sweetwater Restoration Event is scheduled for Saturday April 18th at 9am. Event kick-off will be at Riverbend Park (830 Cove Park Place). 5,000 beneficial native plants are scheduled to be planted by volunteers and homeowners. We expect another great turnout! We continue to see successes in the volunteer planting locations driven by community efforts. Some locations have been greatly impacted by deer grazing on the plants. Thanks to all those that have participated in these events over the years to help improve your lake. We look forward to seeing you on the 18th!

Photo: Recent plantings that are established and expanding well!

Grass Clippings- during our visits we continue to see a large amount of grass clippings in the lakes. These clippings generate fuel for algae to become prolific and directly pollute your waterways. Please direct the clippings away from the water. If you have hired services, please let them know.

Photo: Grass clipping along the shoreline fueling algae growth; observed to be occurring on a weekly basis.

Recommendations:

1 Continue to work together with other lakefront owners to increase native aquatic plantings along shoreline (such as pickerelweed, canna, and duck potato). Have at least one annual lake association meeting to discuss lake-specific issues inviting guest speakers such as county or state biologists. REDUCE the amount of grass clippings entering your lake on a weekly basis.

2 Increase educational outreach programs, including Shoreline Restoration Projects (planting days), Florida Yards and Neighborhoods (FYN) Workshops, and Lake Management Video mail-outs. Most importantly, reducing personal pollution to your lake by decreasing fertilizer usage and using only phosphorous free and slow-release nitrogen fertilizers; maintaining a healthy shoreline with beneficial native aquatic plants; keeping grass clippings out of your lake and out of storm drains that lead to the lake. All of these activities help to protect and preserve your waterbody! Contact LMP at (407) 665-2439 for information about free educational programs.

3 Help spread the word! Obtain email addresses from neighbors not currently on the distribution list in order to share this information with others. Valuable information is contained within these reports.

Have a great day!

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Lake Management website: http://www.seminole.wateratlas.usf.edu/LakeManagement

Mosquito Control website: http://www.seminolecountyfl.gov/pw/mosquito

Seminole Education, Restoration & Volunteer (SERV) Program
Follow prior & upcoming events now on facebook and Twitter!!

SEMINOLE COUNTY WATERSHED MANAGEMENT DIVISION

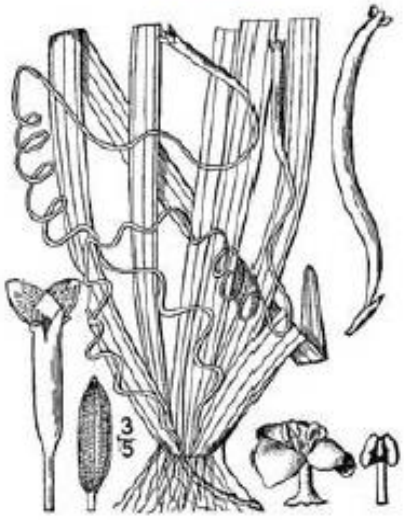
Aquatic Plant of the Month

Eelgrass (*Vallisneria americana*): A Florida Native

Eelgrass, also known as tapegrass, is native to the state of Florida.

Identification

Eelgrass is a submersed, perennial plant that can be found throughout the state in both still and flowing waters. Eelgrass leaves often resemble tape or ribbon. They are about an inch wide with raised veins and rounded tips. The leaves can grow several feet in length and their upper parts can often be found floating along the water surface. Eelgrass produces both male and female flowers, however, the small, white female flowers are most often seen, as their long, corkscrew-like flower stalks reach the surface of the water.

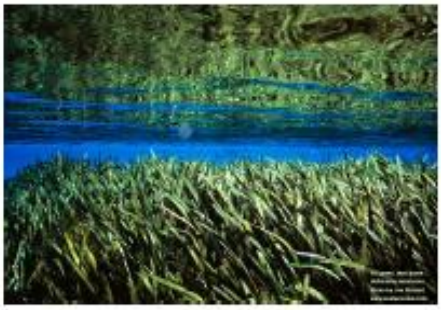


Wildlife Value

Eelgrass is an important food source for the endangered West Indian manatee (*Trichechus manatus*) and various species of waterfowl. Additionally, eelgrass provides important habitat, protection, and nursery grounds for fish.

Native submersed aquatic plants provide habitat for several micro- and macroinvertebrate species, which in turn provide a source of food for fish and other aquatic wildlife species including reptiles, amphibians, and waterfowl. Once aquatic plants die, their decomposing parts provide food (referred to as "detritus") for several aquatic invertebrates.

Additionally, native submersed plants play an important role in the aquatic ecosystem by reducing nutrients within the waterbody and by competing with invasive species for space.



Control

Although native, eelgrass may impede recreational access. For questions concerning control of eelgrass or to apply for a free aquatic plant removal permit, please contact your state agency, the Florida Fish and Wildlife Conservation Commission, online at: http://myfwc.com/license/aquatic-plants or by calling 407-858-6170.

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Sources:

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